

WHAT IS CLAIMED IS:

1. A system for measuring electrostatic discharge (ESD) characteristics of a semiconductor device, comprising:
 - at least one pulse generator generating ESD-scale pulses;
 - a first point of the semiconductor device receiving a first ESD-scale pulse from the at least one pulse generator;
 - a second point of the semiconductor device receiving the first ESD-scale pulse from the at least one pulse generator;
 - at least a third point of the semiconductor device receiving a second ESD-scale pulse from the at least one pulse generator; and
 - a data collector to collect data on the ESD characteristics of the semiconductor device.
2. The system of claim 1, wherein the semiconductor device includes one of a metal-oxide-semiconductor (MOS) transistor, a silicon-controlled rectifier (SCR), a low voltage triggered SCR (LVTSCR), a field oxide device (FOD) and a bipolar junction transistor (BJT).
3. The system of claim 1, wherein the at least one pulse generator includes a transmission line pulse (TLP) generator to generate the ESD-scale pulses.
4. The system of claim 1, wherein the at least one pulse generator includes a transmission line pulse (TLP) generator to generate the first ESD-scale pulse.

5. The system of claim 1, wherein the at least one pulse generator includes a biasing source to generate the second ESD-scale pulse.
6. The system of claim 2, wherein the MOS transistor includes a source and a drain to receive the first ESD-scale pulse, and at least one of a gate and a substrate to receive the second ESD-scale pulse.
7. The system of claim 2, wherein one of the SCR and LVTSCR includes an anode and a cathode to receive the first ESD-scale pulses, and at least one of a substrate and a semiconductor well region to receive the second ESD-scale pulse.
8. The system of claim 2, wherein the LVTSCR includes a gate to receive the second ESD-scale pulse.
9. The system of claim 2, wherein one of the FOD and BJT includes an emitter and a collector to receive the first ESD-scale pulses, and a base to receive the second ESD-scale pulse.
10. The system of claim 1, further comprising a detector to detect a leakage current in the semiconductor device.

11. The system of claim 1, further comprising a switching device coupled to the at least one pulse generator and the detector to switch a connection between the at least one pulse generator and the detector.

12. A system for measuring electrostatic discharge (ESD) characteristics of a multi-terminal device, comprising:

- a first pulse generator providing a first ESD-scale pulse;

- a second pulse generator providing a second ESD-scale pulse;

- a first terminal of the multi-terminal device coupled to the first pulse generator to receive the first ESD-scale pulse;

- a second terminal of the multi-terminal device coupled to the first pulse generator to receive the first ESD-scale pulse;

- a third terminal of the multi-terminal device coupled to the second pulse generator to receive the second ESD-scale pulse; and

- a detector to detect a leakage current of the multi-terminal semiconductor device, wherein the ESD characteristics of the multi-terminal device are determined when the detector detects a leakage current in the multi-terminal device.

13. The system of claim 12, wherein the first and second pulse generators include a transmission line pulse (TLP) generator generating the first and second ESD-scale pulses.

14. The system of claim 12, wherein the first pulse generator includes a TLP generator generating the first ESD-scale pulse.
15. The system of claim 12, wherein the second pulse generator includes a biasing source generating the second ESD-scale pulse.
16. The system of claim 12, further comprising a switching device coupled to the first and second pulse generators and the detector to switch a connection to the multi-terminal device between the first and second pulse generators and the detector.
17. The system of claim 12, wherein the multi-terminal device includes one of a metal-oxide-semiconductor (MOS) transistor, a silicon-controlled rectifier (SCR), a low voltage triggered SCR (LVTSCR), a field oxide device (FOD) and a bipolar junction transistor (BJT).
18. A method of measuring electrostatic discharge (ESD) characteristics of a semiconductor device, comprising:
- providing at least one pulse generator generating ESD-scale signals;
 - identifying a first point on the semiconductor device;
 - identifying a second point on the semiconductor device;
 - identifying a third point on the semiconductor device;
 - providing a first ESD-scale signal to the first and second points of the semiconductor device; and

providing a second ESD-scale signal to at least the third point on the semiconductor device.

19. The method of claim 18, further comprising the step of providing a transmission line pulse (TLP) generator to generate the first and second ESD-scale signals.

20. The method of claim 18, further comprising the step of providing a TLP generator to generate the first ESD-scale signal.

21. The method of claim 18, further comprising the step of providing a biasing source to generate the second ESD-scale signal.

22. The method of claim 18, further comprising the step of providing one of a metal-oxide-semiconductor (MOS) transistor, a silicon-controlled rectifier (SCR), a low voltage triggered SCR (LVTSCR), a field oxide device (FOD) and a bipolar junction transistor (BJT) to serve as the semiconductor device.

23. The method of claim 22, further comprising the step of providing the first ESD-scale signal to a source and a drain of the MOS transistor, and providing the second ESD-scale signal to at least one of a gate and a substrate of the MOS transistor.

24. The method of claim 22, further comprising the step of providing the first ESD-scale signal to an anode and a cathode of the SCR, and providing the second ESD-scale signal to at least one of a substrate and a semiconductor well region of the SCR.

25. The method of claim 22, further comprising the step of providing the first ESD-scale signal to an anode and a cathode of the LVTSCR, and providing the second ESD-scale signal to at least one of a substrate and a semiconductor well region of the LVTSCR.

26. The method of claim 22, further comprising the step of providing the first ESD-scale signal to an emitter and a collector of the FOD, and providing the second ESD-scale signal to a base of the FOD.

27. The method of claim 22, further comprising the step of providing the first ESD-scale signal to an emitter and a collector of the BJT, and providing the second ESD-scale signal to a base of the BJT.

28. The method of claim 18, further comprising the step of providing a data collector to collect data regarding the ESD characteristics of the semiconductor device.

29. The method of claim 18, further comprising the step of providing a detector to detect a leakage current in the semiconductor device.

30. The method of claim 18, further comprising the step of providing a switching device coupled to the at least one pulse generator and the detector to switch a connection to the semiconductor device between the at least one pulse generator and the detector.

31. A method of electrostatic discharge (ESD) testing, comprising:
providing a multi-terminal device;
generating at least one ESD-scale pulses;
providing a first ESD-scale pulse of the at least one ESD-scale pulses to a first and a second terminals of the multi-terminal device;
providing a second ESD-scale pulse of the at least one ESD-scale pulses to at least a third terminal of the multi-terminal device;
collecting ESD characteristics of the multi-terminal device under the first and second ESD-scale pulses; and
detecting if a leakage current flows in the multi-terminal semiconductor device.

32. The method of claim 31, further comprising the step of providing one of a metal-oxide-semiconductor (MOS) transistor, a silicon-controlled rectifier (SCR), a low voltage triggered SCR (LVTSCR), a field oxide device (FOD) and a bipolar junction transistor (BJT) to serve as the multi-terminal device.

33. The method of claim 31, further comprising the step of providing the second ESD-scale pulse to the at least one third terminal before providing the first ESD-scale pulse to the first and second terminals.

34. The method of claim 31, further comprising the step of detecting whether a leakage current flows in the multi-terminal device before providing the first and second ESD-scale pulses.

35. The method of claim 34, further comprising generating the first and second ESD-scale pulses by a transmission line pulse (TLP) generator.